

WIMP Dark Matter and the Cryogenic Dark Matter Search

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The direct detection of dark matter, a major component of the mass-energy budget of the universe, is a topic of central importance to astrophysics, astronomy, cosmology and particle physics. Evidence for dark matter on the cosmological as well as galactic scales is drawn from a variety of observational findings. Particle physics motivates the search for weakly interacting massive particle (WIMPs), the existence of which could explain all observational information about dark matter.

This talk will provide an overview of the search for dark matter, with a focus on the efforts of the Cryogenic Dark Matter Search collaboration in the last decade. Novel athermal phonon-based detectors operating at 50 mK have been used to achieve high sensitivity per unit mass for dark matter elastic scattering. The development and testing of 30 detectors under operation at the Soudan Underground Laboratory since mid-2006 will be described, as well as the expected sensitivity of the CDMS science program at Soudan. Finally, I will comment on the future role to be played by cryogenic semiconductor detection techniques in the broader context of dark matter searches.